# Weather-it: evolution of an online community for citizen inquiry

## Conference or Workshop Item

# Weather-it: Evolution of an Online Community for Citizen Inquiry

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## ABSTRACT
While Citizen Science projects involve people in passive or active project tasks, Citizen Inquiry offers the opportunity for deeper involvement through initiating and facilitating science investigations. This study aims to explore the creation and evolution of Weather-it, a Citizen Inquiry online community hosted by the nQuire-it platform. Weather-it enables people to create and maintain their own weather missions (investigations), to which other people can contribute. The evolution of Weather-it community is explored through social network graphs of Weather-it members and their interactions. Information regarding other aspects of the community such as the type of members, their recruitment and motivations, and the identity and sustainability of the community, is collected through a survey comprising open and closed-ended questions. The results indicate differences in these community engagement aspects between Citizen Science and Citizen Inquiry projects, providing insight into the behaviour of people in projects that require more active involvement throughout the scientific investigations.

## CCS Concepts
**• Social computing paradigm→Computer supported cooperative work • Collaborative and social computing computing→Collaborative and social computing design and evaluation methods • Interaction paradigms→Web-based interaction**

## Keywords
Community Evolution; Citizen Science; Citizen Inquiry; Public Engagement

## 1. INTRODUCTION
Citizen Science projects involve people in project tasks at differing levels of participation. Distributed computing projects exploit computing processing power, requiring passive participation from the citizens; distributed data analysis projects provide more active engagement with classification, annotation and other activities; and distributed collaboration projects require active collaboration of participants for the completion of project tasks [1]. However, the need for balance between the learning outcomes and the scientific goals within Citizen Science projects has been argued, which may lead to both successful data collection and expected broader learning goals [2].

Citizen Inquiry is an innovative method of informal science learning that aims to enable the engagement of citizens in online scientific investigations [3]. It combines aspects from Citizen Science and Inquiry-based Learning, such as knowledge sharing and peer review (Citizen Science) and experimentation, discovery, critique and reflection (Inquiry-based Learning). Moreover, it enables people to create and maintain their own investigations, to which other people can contribute, which is also the main difference from Citizen Science projects. This ownership of the investigation and its practices leads to greater and active involvement and may add to enhancement of competence, performance and recognition [2] and finally lead to participants reaching higher levels of engagement [4]. The key question is how does this ownership of the investigations influence the participation of such a public engagement community?

The importance of Citizen Science participants and their motivations for joining projects has been noted in many studies (e.g. [5], [6], [7]). These studies reflect on how these motivations influence project planning and the development of appropriate technical and social infrastructures. This study builds on research on Citizen Science and online communities to develop the appropriate components of Citizen Inquiry; it explores how a Citizen Inquiry project should be created, developed and sustained, while also seeking more information regarding the members (recruitment, motivations, community identity).

The paper is structured as follows: the next section describes the creation of Weather-it Citizen Inquiry project; the section that follows develops research questions about the community engagement aspects and describes the research methods; the following sections present the results and discuss the findings; and the final section provides conclusions, pointing to future work.

## 2. WEATHER-IT
Weather-it is a Citizen Inquiry project which aims to explore the creation of an active and sustainable community for citizens around the world to propose, design, manage and share weather investigations such as identifying clouds, looking for relations between air pressure and rainfall, and discussing why there are two tides each day of approximately equal heights.

### 2.1 nQuire toolkit
The Weather-it project takes place on the online Citizen Inquiry platform nQuire-it, while the Sense-it Android app facilitates the process of data collection. The nQuire-it platform and Sense-it


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app have been designed as part of the project nQuire: Young Citizen Inquiry [8] and scaffold the needs of Citizen Inquiry: they assist citizens in conducting their own science investigations, enhance the social investigation aspect and promote scientific thinking and exploration of the world.

The Sense-it Android app activates the existing sensors of Android smartphones and tablets, such as light sensor, humidity, pressure, temperature, etc. It allows users to select sensors for their measurements and then visualize, store and download the log files on their mobile devices. Sense-it also creates profiles that can be connected to Citizen Inquiry investigations hosted at the nQuire-it platform and uploads automatically the measurements to the platform. The Sense-it app can be found in Play Store.

The nQuire-it platform offers three types of investigation (missions), with different methods of data collection, for the members: Sense-it missions are connected to the Sense-it Android application, Spot-it missions use uploaded pictures for the data collection, and Win-it missions have a research question which requires text as an answer.


**Figure 1: nQuire-it platform - www.nquire-it.org**

## 2.2 Core Group

'Core group' plays a vital role in the success of the community, and all new members are potential members of this group [9]. At the beginning of the project, a group of ten people interested in weather (experts and non-experts) was recruited by the lead author from around Europe to form the core of the community. The target of the core group was to activate the community before other participants arrived. In this way, some activities and discussions were ready for the first members to join. Concurrently, the core group sent invitations to their social networks to join and they supported the newcomers.

## 2.3 Recruitment

Research showed that the most important reason that people never join a research community is because they have never heard of it [10]. To this end, Weather-it made strenuous efforts to publicise the community. For the enrolment of members (experts and non-experts), invitations were sent to communities related to learning, citizen science, public engagement with science, weather as well as in Social Networks and mailing lists. Some examples are the Royal Meteorological Society (RMetS) and the Tornado and Storm Research Organisation (TORRO), the online community UK Weather Watch, the iSpot Citizen Science project, the mailing list of NCCPE-PEN public engagement organisation, the Weather-it Facebook page and other Facebook groups, teachers forums, etc. The recruitment was continuous. The initial advertisement involved a leaflet which included the aim of Weather-it community, the nQuire-it features and information on how to register. A later recruitment to other places was facilitated by recipients of the leaflet, members of the core group and the community members.

## 2.4 Activities

The participants, of all levels of weather expertise, could create or join weather missions and invite their network to join too. The missions could be weather questions they have in their everyday life (e.g. identify clouds), a phenomenon they want to investigate further (e.g. extreme weather), or something related to climate (e.g. climate change). Joining a mission, allowed them to add posts and ideas related to that mission, and like or comment on other posts. Additionally, the members can use the forum to discuss their questions and ideas. The weather experts in Weather-it were also volunteers and thus they did not possess a facilitator role in the project; they could create missions for learning purposes or contribute to other missions. The interactions between the participants and the missions are reported in previous work [11].

## 2.5 Communication with Participants

Kraut and Resnick [12] in their research identify factors that support and reinforce the participation and contribution of the members in the community. These factors mainly concern notifying the members about the new activities and the need to contribute, encouraging them to contribute, setting goals, providing feedback, promoting existing contributions and publishing participation levels. During this project, some actions were designed to keep the members engaged to the community. These include get started steps and a missions guide for the newcomers, the creation of forum topics with updates and announcements, a mailing list with the new activities, email notifications and a Facebook group with daily posts which aimed to remind the members to visit the community again. At the same time, the members who were committed to the platform had the opportunity to win monthly prizes for their participation (e.g. the most voted one, the top contributor, the best photographer, etc.). Finally, personal contact with inactive people was sought, in case the member faced problems with their participation. These activities aimed to keep the community going by enhancing the commitment to the community [13].

# 3. METHODS

For the purposes of this study, data from 14 weeks (23/11/2014-1/3/2015) were exported from the nQuire-it database. For the use of these data, the members of the community have given their consent for that specific time interval. Prior to the analysis of the data, the names members used on the platform were changed to ones inspired by cloud and wind types (e.g. Cumulus, Zephyros). The final number of the participants registered with Weather-it project was 101, but 23 of them did not go on to join the nQuire-it platform.

## 3.1 Research Questions

This paper aims to address the following questions:

- Recruitment: *Where did the members hear about "Weather-it"?*
- Motivation: *Are the motivations for participating in this Citizen Inquiry project different from other Citizen Science projects?*

- Participants: *Who participates in Citizen Inquiry communities?*
- Evolution: *How did the community evolve? What affected its evolution?*
- Sustainability: *How sustainable was the community?*
- Identity: *Do the members feel like a part of the community? If not, why?*

## 3.2 Data Collection and Analysis

### *3.2.1 Questionnaire*

Quantitative and qualitative data have been generated by the 61 questionnaires. Statistical analysis of some of the data was undertaken with the aim of exploring the relationships between and within some variables, such as the recruitment, the motivations, the participants and the sustainability of the community. Moreover, a chi-square analysis using SPSS was executed to explore the association between the activity (or not) of a member and whether they feel like a part of the community.

The qualitative feedback from the questionnaire was subjected to a thematic analysis. Coding themes were devised in nVivo for each open-ended question after reading the responses and identifying keywords and topics. The occurrence of each keyword or theme was counted and this has formed the basis of some graphical representations or summarised tables.

### *3.2.2 Social Network Graphs*

For the exploration of the Weather-it evolution a social network analysis (SNA) approach was taken. Social network graphs should help appreciate the structure of the Weather-it community over time, answer questions like how the community has evolved and give insight into which reinforcement activities promoted that evolution. SNA conceptualizes individuals or resources as nodes, which will be connected by ties if a link exists between two nodes [14]. The Weather-it ties represent the contributions between the members. The contribution may be (a) membership in missions, (b) data to missions, (c) comments to missions or posts, (d) liking posts, and (e) posting to the forum.

The participants who registered for Weather-it but did not register with the nQuire-it platform (23) are excluded from the SNA. The data from 78 members were then imported into Gephi in a spreadsheet and the generated network graph shows who-contributed-to-whose. A timeline of the graph alongside the weekly data recording were then used to split the evolution on the community into stages, based on the data trends. Therefore, the evolution followed a non- linear community life-cycle [9], encountering the stages, suggested by Preece [15], of early-life, death, and finally maturity. The stage of early-life represents the first four weeks (Weeks 1-4), with 45 nodes and 142 edges, followed by the decline of the community for the next three weeks (end of 7$^{th}$ week), with 52 nodes and 168 edges. In the third stage (Weeks 8-11) there is increased activity, with a total of 68 nodes and 255 ties, which leads to the final stage (Weeks 12-14) where the community matures and becomes more sustainable. The final number for the Weather-it community is 78 nodes and 420 ties.

# 4. RESULTS

This section presents the results for all the community engagement aspects.

## 4.1 Recruitment

Interestingly, word-of-mouth through friends and colleagues has been found to be the most important factor in attracting members to the community (Figure 2). This is consistent with the questionnaire results that show 43% of the members inviting other people to join the community. Circulating the advertisement around social networks (Facebook and Twitter) and mailing lists (NCCPE, ICHM, etc.) were in the second and the third place respectively in the recruitment of participants.

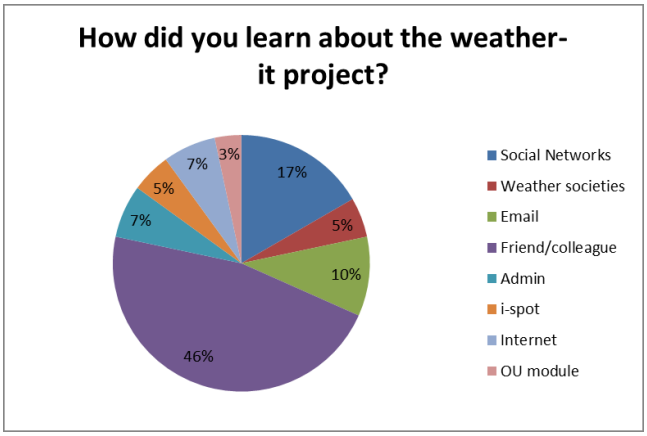


**Figure 2: Recruitment Weather-it**

The results indicated browsing the internet as a source of recruitment. One of the members also added in her response that she came across nQuire-it when searching for the word "cloud". Of equal importance is the recruitment by the admin of the community, mostly towards the experts. Other results include weather societies (e.g. MetOffice, TORRO, etc.), the i-Spot Citizen Science project and finally an Open University module related to Weather.

## 4.2 Motivation

Most respondents gave more than one reason for joining the community (Figure 3). One of the main motivations for joining the community was interest in weather, the topic of the project, followed by "friends" who have already joined the community. Some members were also attracted to join because of the Weather-it community and their interest in the technology used for the investigations.

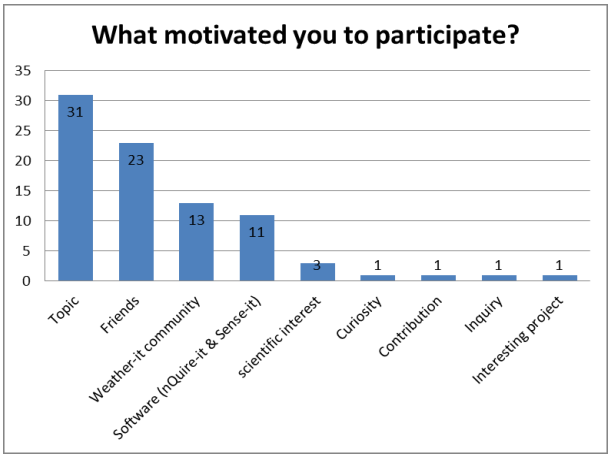


**Figure 3: Motivations for joining Weather-it**

A smaller number of members are motivated by their interest in science (and Citizen Science) while some others joined the community out of curiosity. Desire for contribution was also

mentioned by a member as well as interest in inquiry and the project.

## 4.3 Participants

The majority of the respondents (62%) when asked about their experience of Weather, declared themselves as beginners on the topic, 25% of the participants stated that they have intermediate knowledge on weather, and 13% described themselves as weather experts.

**Table 1: Level of expertise**

| Expert | |
|---|---|
| • Meteorologist<br>• Meteorology Professor<br>• PhD student | • BSc in Meteorology<br>• Weather association member |
| **Intermediate** | |
| • In related job<br>• Owner of weather station<br>• BSc student in Meteorology | • Racing sailor<br>• Familiar with weather forecasts |
| **Beginner** | |
| • Sailor/photographer<br>• Interested in strange phenomena/sky colours/clouds<br>• Weather books<br>• Physics A' level | • Country of accommodation<br>• Curious/want to learn<br>• Weather data collection and monitoring |

Table 1 shows how the members justify their level of expertise. The experts are weather professionals, junior or senior academics and members of weather association. Members that consider themselves as intermediates have a job (agronomist) or hobby (racing sailor) that requires weather knowledge, own weather stations, or they study meteorology (formally and informally). Weather beginners may also have a hobby that combines weather (sailing/photography), study/studied weather or want to learn more about it. Some beginners are interested in particular weather phenomena or in a country's weather. Moreover, a beginner is interested in weather data collection and monitoring. Finally there were some members that have no experience of weather at all but they joined to learn about it.

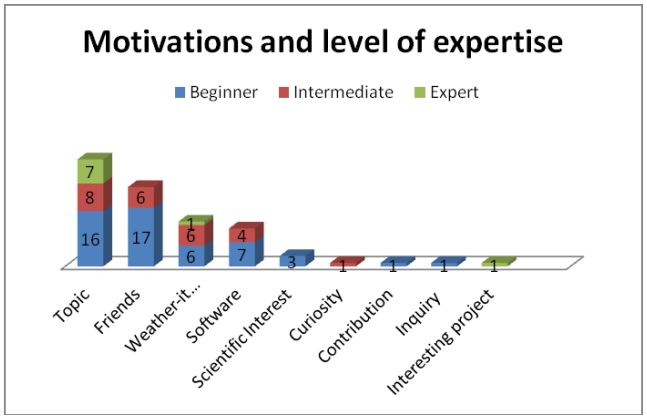


**Figure 4: Motivations and level of expertise**

When comparing the motivations between expert, intermediate and beginner members (Figure 4), it looks like experts were more interested in the topic whereas intermediates and beginners had more reasons to join the community beyond the topic, such as their friends who also joined the community. A reason for being motivated by "friends" and community comes from a beginner who has created a mission: "We all exchanged opinions and I liked that more than searching alone" (Typhoon).

## 4.4 Community Evolution

In the first stage, the community rapidly expands due to the persistent advertisement, and it takes a first shape. The members start to interact with each other through the missions and the forum. An important factor in building ties between the members is the initial core group, which along with the administrator of the community (the first author of this paper), creates the initial missions and forum topics, so that the first participants will not find an empty place. Members of the core group also encourage the new posters by responding to their comments and commenting on their posts. Moreover, daily updates can be found on the Facebook page of the community.

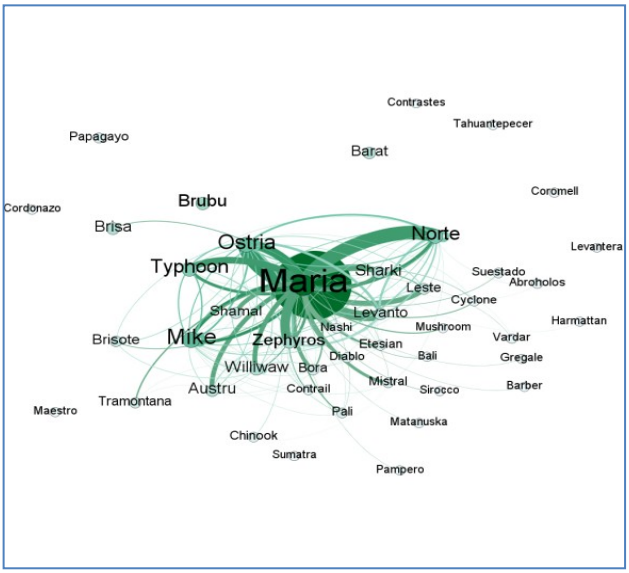


**Figure 5: Weather-it Network Graph - end of 4th week (21/12) (45 nodes - 142 ties)**

The graph in Figure 5 represents the Weather-it members and their ties according to their contributions to other members, at the end of 4th week. The 45 members of the community, including the admin, Maria, who is the central node, had 142 interactions of any nature. The core group members had created three new missions and that increased the number of the interactions. Although the community was rapidly expanding in members, 8 out of 45 members seem not to have any interaction with others.

The second stage, finds the community rather unchanging regarding both the members and their interactions. Possible explanations for this stasis are a) the Christmas break, which took the members away from their computers and to holidays, b) members linked to a particular mission that finished at the end of the 4th week: *"The mission I applied for (sun recording) ended"* (Nashi). c) members who felt that they had contributed enough: *"I joined a few of the missions and submitted some data and after a while I felt there wasn't much more I could do."* (Bora) and d) the absence of notifications by that point: *"I did not communicate much with the participants, in the beginning because I was not receiving notifications about my posts, in case someone has answered, and then I lost interest"*(Austru).

The graph in Figure 6 represents the members and their interactions by the end of the 7th week. The community has 7 new members and 26 interactions within three weeks. Moreover, the eight members who had no interactions with other people in the community in the first stage, remain unconnected in stage two as well. Finally, one more member (Boreas) has obtained a central role in the community and become part of the core group.

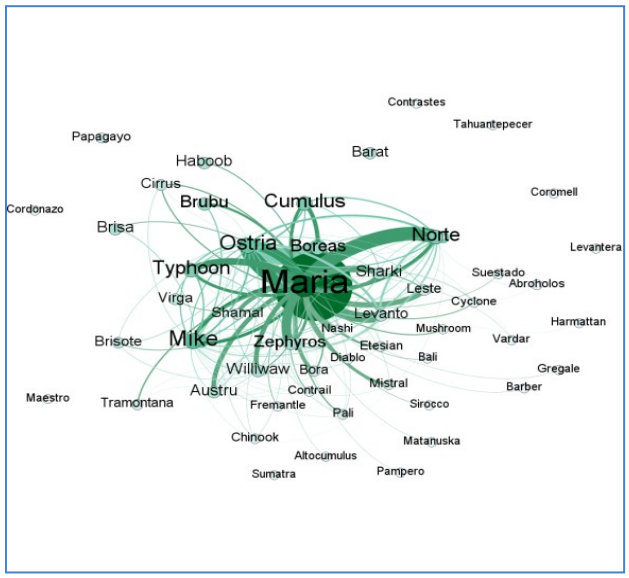


**Figure 6. Weather-it Network Graph - end of 7th week (11/1) (52 nodes - 168 ties)**

During the third stage, the community starts evolving again. The lead author sets up a manual notification system that informs the members when they have posts on their missions, and comments on their posts and forum posts. Alongside the notification system, a mailing list with weekly Weather-it updates is set, notifying the members for the community news and inviting them to contribute by adding posts or their missions. The update messages are also posted to the Facebook page and a new wave of advertisements is released and people share the community invitation with groups that may be of their interest. Finally, people who have signed up through the consent form but did not registered with the nQuire-it are sent reminders to their e-mails.

Consequently, with the notifications and the updates, not only the existing members return to the platform more frequently to view their replies but also new members join the platform. Some members also consider themselves part of the community because of the updates: *"I felt included due to the frequent updates in my inbox"* (Barber), *"The regular update emails and Facebook activity make it easy to feel part of the community"*(Sumatra).

The graph in Figure 7 represents the members and their interactions by the end of the 11th week. The community has 16 new members and 87 interactions within four weeks. Part of the reason that the number of interactions have increased are the two new missions created by members, and the approaching deadline for a popular win-it mission created by a core group member. However, there are 16 unconnected members of whom 7 were unconnected from the beginning of the community.

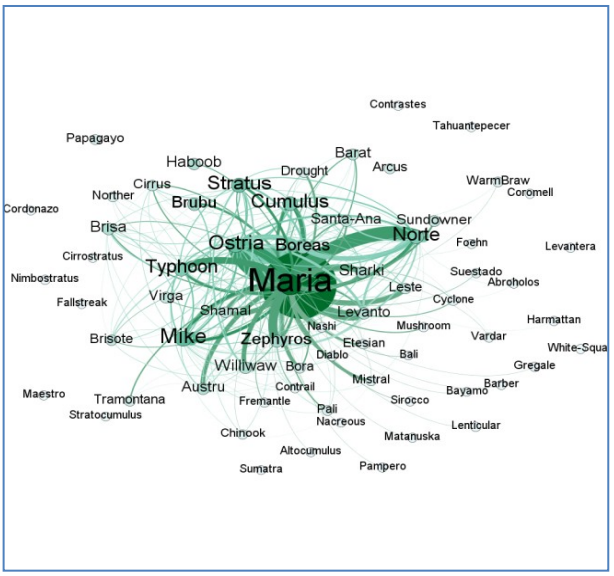


**Figure 7. Weather-it Network Graph - end of 11th week (8/2) (68 nodes - 255 ties)**

In the fourth and final stage, the community becomes more stable, maintaining the rhythms at neither extremely high nor low levels. The data logs of the community provide information to spot the non-active members, who have had an activity in the community in the past weeks, and the admin sends a personalised message reminding them their Weather-it membership. Moreover, some more advertisements are released. The weekly updates include reminders for the prizes and requests to the more experts to help with their feedback on specific missions.

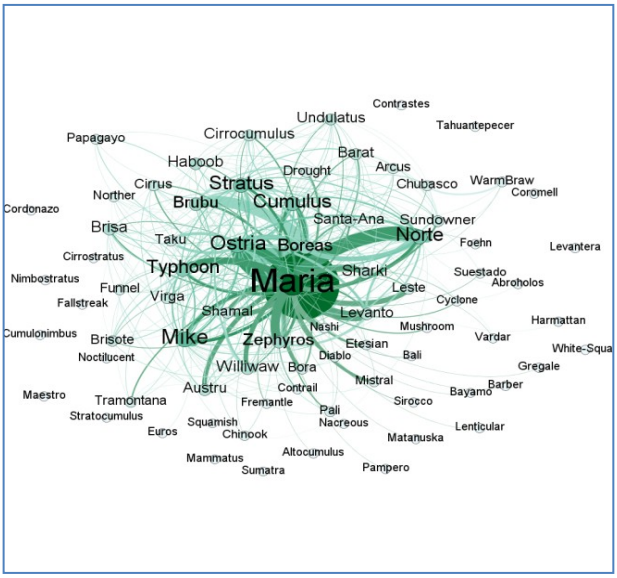


**Figure 8. Weather-it Network Graph - end of 14th week (1/3) (78 nodes - 420 ties)**

Two more missions are created and the members of the community become more active. They draw conversations on the uploaded data and sometimes argue about its content; they start to use common language following some terminology around the topic (e.g. they argue about the type of a cloud). They distinguish their roles inside the community and they eventually recognise who the experts are. The experts visit the community more often

to provide feedback. The members are now more interested in winning the prizes and two of them are even giving negative votes to their adversaries.

Figure 8 shows the final version of the community, at the end of the 14th week. The community has 78 members and 420 interactions and thus, a further ten members and 165 interactions within 3 weeks. There are still 15 unconnected nodes of whom four are members who joined the platform in this stage. Of those 15 unconnected members, only three completed the questionnaire. The reasons they gave for not being active are being a new member (Mammatus), lack of time (Sumatra) and bad timing (Tahuantepecer).

Note that a video version of the community evolution can be found at: https://www.youtube.com/watch?v=kVzI378hvj0

## 4.5 Sustainability

This section focuses on the number of the total active members (new and returning) every week as well as the number of contributions.

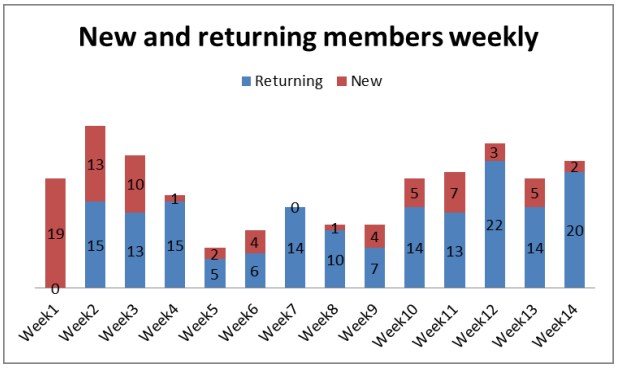


**Figure 9: New and returning members weekly**

Figure 9 shows the number of new and returning members weekly. Week 1 starts with the core group, followed by Week 2 and Week 3 when the advertisements are released. Week 4 faces a decline particularly of the new members – one reason being the Christmas break. Then Week 7 shows an increase with the start of the notifications and weekly updates. Week 10 to Week 14 show a pattern that remains stable with small changes based on whether there are interesting activities for the returning participants or somebody shared the community with a new member.

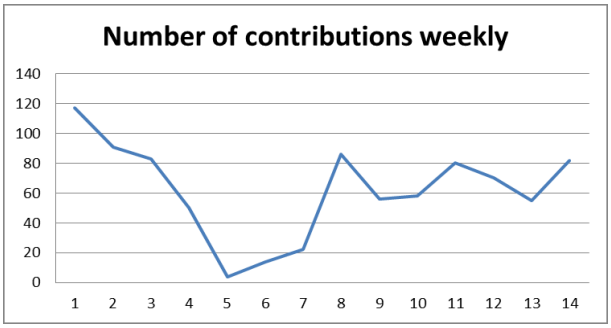


**Figure 10: Number of contributions weekly**

Figure 10 shows the weekly activity of the community - the total contributions. The activity seems to be high in the Week 1 and then gradually decreases, reaching the bottom by Week 5, where the active members were at a minimum. Then, it increases in Week 7 with the notification establishment and takes off reaching a top point in Week 8 when two missions were released. Then, as the notifications remain stable, the level of activity fluctuates slightly according mostly to the creation of missions and posts.

## 4.6 Community Identity

Beyond the evolution and sustainability of the community, an interest aspect is whether the members themselves feel part of this community. Most of the respondents (68%) answered that they feel like a part of the community. The participants who gave a negative answer (32%) are then categorised in three groups. Table 2 shows these groups, with proportion representation, and the reasons for not feeling member of the community in every group.

**Table 2. Members who do not feel like a part of the community**

| Group | *Sample* |
|---|---|
| Non-registered participants (6%) | *"I never did anything on the site. I think it's a great idea, but the timing was bad for me."* (Squamish) |
| Participants with a few interactions (47%) | *"I didn't take the time to get involved."* (Nacreous)<br>*"I wasn't very active. Mostly observing."* (Matanuska)<br>*"I didn't really start using the website properly and so my lack of community engagement did not come from being made to feel unwelcome"* (Gregale)<br>*"Because I felt not like a forum. It was a little bit impersonal. No participation in the extent I wanted."* (Fremantle) |
| Participants with many interactions (47%) | *"I did not communicate as much with the other participants."* (Austru)<br>*"Not really because I have registered recently and I haven't spent much time on it."(*Funnel)<br>*"Some of the other members seemed to be fairly young and I'm not!"* (Santa-Ana)<br>*"I visit the page rarely"* (Brubu)<br>*"I wasn't active enough nor had the time to feel like one of the community, and I believe being member of a new strange (strange in the meaning of unfamiliar) community needs some sort of communication, like face to face conversation, skype call, voice call..."* (Mistral) |

Therefore, the reasons for not feeling a member of the community are related to the lack of time, visits, involvement, participation and notifications, but also to the perceptions of the members on the proper type of communication, the age match and the membership status. It is remarkable that a large percentage of the members who did not feel as part of the community were people who have high levels of activity on the platform.

The chi square test indicates that there is an association between the active members (at the point of the survey) and whether they

feel like a part of the community (Chi-Square = 5.001, $P<0.05$). This finding reflects the fact that when members feel like a part of the community, about 78% remain active and 22% are not, whereas when they do not feel like a part of the community, 53% abandon it.

# 5. DISCUSSION

The findings regarding the participants joining the community are aligned to studies that suggest word-of-mouth as the most powerful advertisement [16]. The word-of-mouth recruitment of Weather-it members seems to be the most effective means of inviting people. Mission and data owners may be the source of the 'news'. Indirect recruitment through mailing lists and social networks was effective for attracting people who had no connections with the community, and thus had little prior knowledge of the community. Although the advertisement of the community targeted mostly Citizen Science, weather societies, and modules related to weather, only a small proportion of the members heard about Weather-it from there. Moreover, none of the participants was recruited from the paper leaflets. An unexpected finding was also linked to the "searching the internet" answer, as these members joined the community with no invitation or information about it.

Since Weather-it had no specific goals but the involvement of the members with weather investigation and discussion, the motivations for participating in the community differ from other Citizen Science projects. Comparing the results with a recent research study on motivations that initiate participation in Citizen Science projects [1], some main differences were spotted. Whereas in other CS projects the main reasons for participating is the contribution to research ([1], [7], [17]) and the interest in science, Weather-it members ranked the specific topic of the project (weather) as their first reason (interest and learning). Contributing to science and scientific interest ranked last, after the social-related reasons (friends and community), and the interest in the software. As expected, "Goals of the project" was not a part of the reasons that led them to join the community, as Weather-it had no specific goals linked to a single research project. However, a reason for the difference between the motivations for participating in Citizen Science versus Citizen Inquiry might lie in the nature of nQuire-it missions. A potential scenario is that the participants get involved in everyday life topics, without labelling them as science. Part of the reason for this behaviour might be the background of the participants, as very few were meteorology scientists or associated to weather or a related field in a professional manner. Thus, there are individuals that bring some expertise to the project and beginners who want to learn more about the topic along with their friends in a community offered as a learning experience.

Overall, it appears that the evolution of the community depends mainly on the project communication – the advertisement, the notifications, the daily/weekly updates, and the personalised messages to the participants. Of equal importance is the behaviour of some members, such as the core group and the experts, whose contributions provide a spark of interest for other members. Having established the nature of the community and Citizen Inquiry, the members gradually use common vocabulary, recognise who the experts are and they get to share more useful things. The last six weeks find the community at a maturing stage with steady fluctuations. The findings indicate that the sustainability of the Weather-it relies upon the ongoing support of the community administrator. This supports the findings of previous research that identifies the fundamental design set in motion from the early first stage of the community development inadequate to make the community "run itself" [18]. Alternatively, the ongoing design and development, as applied in Weather-it, should depend on the individual community and its needs ([19], [20]).

Feeling a part of Weather-it reflects the commitment to the community [21] and thus predicts whether they will remain members in the future. Although the majority of the members felt like a part of the community, an important percentage did not. Surprisingly, almost half of those are members with many contributions to the community. The reasons for not feeling a part of the community are related to a) the absence of opportunities for bond-based commitment (members closer to other members) as the project was mission-centric, b) homogeny issues (different age), c) frequency of visits, and d) newcomers. Another potential reason may be the lack of a main goal, as Weather-it employed many investigations each with their own goals. This may affect the identity-based commitment of the members, as there is no sense of a common enterprise from which they will benefit [22]. However, the findings show that contribution to the community is not necessarily linked to feeling like a part of it; but when members feel like a part of it, it is less likely that they will leave.

# 6. CONCLUSIONS

This paper described the creation and evolution of a Citizen Inquiry online community on weather. For the creation and the maintenance of the community, design principles borrowed by research on online communities were employed. To explore the potential and efficiency of the community engagement aspects (recruitment, motivation, members, evolution and sustainability activities, community identity), data were retrieved from social network graphs and questionnaires. The findings were then compared to those of other Citizen Science projects and to studies on online communities.

With all the community engagement aspects considered, we shall now return to the main issue mentioned at the onset of this study: Does the ownership over the investigations affect the course of a public engagement community; if so, how?

Word-of-mouth seems to be the most effective means of recruitment and the members, owners of missions and data may be the "transmitters". The basic reason for members to join the community was the interest in the topic, in contrast to other Citizen Science projects in which contribution/interest in science rank first. Moreover, Weather-it attracted many beginner members who have neither weather experience nor science background. Whereas experts joined the project mainly for the topic, beginner and intermediate members have also ranked "friends" and "community" in a higher level, and a reason for this may be the need for collaborative research on topics they are interested in.

Although the creation and evolution was rapid, the community managed to sustain itself for the last six weeks. Nevertheless, one of the limitations is that the evolution and sustainability of the community depends mainly on the project communication and the ongoing support of the administrator. Evidence from this project indicates that sustained engagement and evolution of a Citizen Inquiry community will require active engagement of a person, not only in moderating and contributing to discussions and other activity on the site, but also in promoting the activity through other social media.

Finally, the majority of the members feel like a part of the community and the findings showed that feeling a part of the community increases the likelihood to remain active. Still, there are concerns about the members who did not feel like a part of the community, even though they had many contributions.

Sustaining the community and enhancing the community feeling of the members are issues to be explored further. A limitation encountered in this research is the small dataset in terms of number of volunteers and duration of the project. Planning future studies should include technical and social infrastructures that will be able to support active facilitation in communities bigger than Weather-it and provide indications of members' performance relative to others, and rewards that value the high participation.

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